UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/039,189	12/31/2001	Hawkins Yao	069099.0106	7165

23640 7590 04/08/2005

BAKER BOTTS, LLP
910 LOUISIANA
HOUSTON, TX 77002-4995

EXAMINER	
DALENCOURT, YVES	

ART UNIT	PAPER NUMBER
2157	

DATE MAILED: 04/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/039,189	YAO ET AL.	
	Examiner	Art Unit	
	Yves Dalencourt	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/15/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is responsive to communication filed on 12/31/01.

Information Disclosure Statement

The information disclosure statement filed 12/31/01 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the information listed in the 1449 provided by Applicant(s) are copending applications and should not be part of the IDS. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Specification

The status of the "Cross-Reference to Related Applications" listed on paragraph [0001] of the specification needs to be updated.

Claim Objections

Claims 11 and 12 is objected to because of the following informalities: It is suggested to delete " an " before VOQ ingress buffer (claim 10, line 3), and insert -- a --.

It is suggested to delete " an " before switch (claims 11 and 12, line 2) and insert -- said each --.

Also, claim 11, line 2 recites " a VOQ egress buffer ". To be consistent with claim 10, " a VOQ egress buffer " is read as -- said VOQ egress buffer --.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al (US 20030099193; hereinafter Liu).

Regarding claim 1, Liu teaches a method for providing XON/XOFF port-level flow control for a computer network that has access to a plurality of network processors in communication with the computer network, wherein at least one network processor is composed of an egress port associated with an egress buffer, and a set of network

processors is associated with a bridge (figs. 1 – 2; paragraphs 0034 - 0037), the method comprising the steps of determining if the depth of an egress buffer for an egress port has reached a high watermark (fig. 3; paragraph [0042], lines 1 – 17; Liu discloses that in order to prevent egress queue overflow, an array of nineteen counters 40 is employed to count the number of cells destined for each egress queue from each of the ingress queues); generating an XOFF message associated with the egress port if the egress buffer of has reached the high watermark (paragraph [0042], lines 17 – 18; paragraph [0044], lines 1 – 9; Liu discloses that when an egress queue accumulates cells up to a point possibly causing overflow, it raises a warning signal and the signal sets a relative bit in the backpressure bitmap); and sending the XOFF message to the network processors, wherein the network processors will stop sending cells to the egress port associated with the XOFF message in response to receiving the XOFF message (paragraph [0042], lines 18 – 20; paragraph [0044], lines 9 – 22; Liu discloses that when a counter value reaches the threshold, a backpressure signal is asserted to stop the UTOPIA Level 2 interface 44a from accepting any further cells destined for that particular egress queue).

Regarding claim 2, Liu teaches the method of claim 1, wherein the computer system further comprises a switch fabric (10, fig. 1; paragraph [0034]; Liu discloses a switch 10, which is a non-blocking and lossless cell-based switch on a single chip); and wherein the network processors are in operative communication with the switch fabric via the associated bridge (paragraph [0040]; Liu discloses that for each priority level of multicast, a common UTOPIA port address (claimed bridge) is used for all ports).

Regarding claim 3, Liu teaches the method of claim 2, wherein the step of sending the XOFF message to the network processors further comprises the steps of forwarding the XOFF message to the switch fabric (paragraphs [0042], [0045]; Liu discloses that at any given moment, there can be multiple cells in transition on the switch bus. The number of cells in transition depends on the number of switch ports); and forwarding the XOFF message to the bridges (paragraphs [0042], [0047], and [0048]; Liu discloses that when the UTOPIA input interface receives a backpressure indication, it uses standard UTOPIA signaling to refuse cells destined for the affected queue).

Regarding claim 4, Liu teaches the method of claim 2, which further teaches the steps of determining if the depth of an egress buffer for an egress port has reached a low watermark (fig. 3; paragraph [0042], lines 1 – 17; paragraph [0044], lines 12 – 15; Liu discloses that in order to prevent egress queue overflow, an array of nineteen counters 40 is employed to count the number of cells destined for each egress queue from each of the ingress queues); generating an XON message associated with the egress port if the egress buffer has reached the low watermark (paragraph [0042], lines 20 – 23; Liu discloses that when the counter value decreases from the threshold, the back-pressure signal is immediately de-asserted so that other cells destined for that egress queue can be accepted); and sending the XON message to the network processors, wherein the network processors will resume sending cells to the egress port associated with the XON message in response to receiving the XON message (paragraph [0042], lines 20 – 23; Liu discloses that when the counter value decreases

from the threshold, the back-pressure signal is immediately de-asserted so that other cells destined for that egress queue can be accepted).

Regarding claim 5, Liu teaches the method of claim 2, wherein the step of sending the XON message to the network processors further comprises the steps of forwarding the XON message to the switch fabric (paragraphs [0042], [0045]; Liu discloses that at any given moment, there can be multiple cells in transition on the switch bus. The number of cells in transition depends on the number of switch ports); and forwarding the XON message to the bridges (paragraphs [0042], [0047], and [0048]; Liu discloses that when the UTOPIA input interface receives a backpressure indication, it uses standard UTOPIA signaling to refuse cells destined for the affected queue).

Regarding claim 6, Liu teaches the method of claim 5, wherein the bridge maintains a VOQ for each egress port of each network processor associated with the bridge, wherein each VOQ is associated with a VOQ egress buffer ([0040]; Liu discloses that for each priority level of multicast, a common UTOPIA port address (claimed bridge) is used for all ports and a common backpressure bit is used. UTOPIA PHY addresses are mapped to port egress queues as shown in table 1).

Regarding claim 7, Liu teaches the method of claim 6, which further comprises the steps of generating a congestion indication message associated with the egress port if the VOQ egress buffer has reached a high watermark, wherein the egress port is associated with a network processor (42, fig. 2; paragraph [0044]; see page 19); and sending the congestion indication message to the network processor associated with

the egress port, wherein the network processor associated with the egress port generates the XOFF message in response to receiving the congestion indication message (paragraph [0044]; see page 19; Liu discloses that two parameters are used to determine when to raise and lower the warning signal. These are high watermark adjustment (HWMA) and watermark offset (WM_OFFSET). HWMA is used for raising the congestion condition flag).

Regarding claim 8, Liu teaches the method of claim 7, which further comprises the steps of generating a congestion cleared indication message associated with the egress port if the VOQ egress buffer has reached a low watermark, wherein the egress port is associated with a network processor (42, fig. 2; paragraph [0044]; see page 19); and sending the congestion cleared indication message to the network processor associated with the egress port, wherein the network processor associated with the egress port generates the XON message in response to receiving the congestion cleared message (paragraph [0044]; see page 19; Liu discloses that two parameters are used to determine when to raise and lower the warning signal. These are high watermark adjustment (HWMA) and watermark offset (WM_OFFSET. VW_OFFSET is used for clearing the congestion condition flag).

Regarding claim 9, Liu teaches the method of claim 8, which further comprising the steps of determining if a cell is discardable (paragraph [0010]; and discarding the cell if the depth of the egress buffer for the egress port has reached a high watermark (paragraph [0010]).

Regarding claim 10, Liu teaches the method of claim 9, wherein the switch fabric comprises a plurality of switch ports, wherein each switch port is in operative communication with a bridge and is associated with a switch VOQ, wherein each switch VOQ is associated with an VOQ ingress buffer (paragraphs [0034] – [0037]; Liu discloses a switch 10 having eight switch port 18a-18h, and each port also includes a sixteen-bit mode UTOPIA Level 2 compliant interface 44a, 44b).

Regarding claim 11, Liu teaches the method of claim 10, which further comprising the steps of determining if the depth of a VOQ egress buffer for an switch port has reached a high watermark (fig. 3; paragraph [0042], lines 1 – 17; Liu discloses that in order to prevent egress queue overflow, an array of nineteen counters 40 is employed to count the number of cells destined for each egress queue from each of the ingress queues); generating an XOFF message associated with the switch port if the VOQ egress buffer has reached the high watermark (paragraph [0042], lines 17 – 18; paragraph [0044], lines 1 – 9; Liu discloses that when an egress queue accumulates cells up to a point possibly causing overflow, it raises a warning signal and the signal sets a relative bit in the backpressure bitmap); and sending the XOFF message to the network processors, wherein the network processors will stop sending cells to the network processors associated with the bridge coupled to the switch port associated with the XOFF message in response to receiving the XOFF message (paragraph [0042], lines 18 – 20; paragraph [0044], lines 9 – 22; Liu discloses that when a counter value reaches the threshold, a backpressure signal is asserted to stop the UTOPIA

Level 2 interface 44a from accepting any further cells destined for that particular egress queue).

Regarding claim 12, Liu teaches the method of claim 11, which further comprising the steps of determining if the depth of a VOQ egress buffer for an switch port has reached a low watermark (fig. 3; paragraph [0042], lines 1 – 17; paragraph [0044], lines 12 – 15; Liu discloses that in order to prevent egress queue overflow, an array of nineteen counters 40 is employed to count the number of cells destined for each egress queue from each of the ingress queues); generating an XON message associated with the switch port if the VOQ egress buffer has reached the low watermark (paragraph [0042], lines 20 – 23; Liu discloses that when the counter value decreases from the threshold, the back-pressure signal is immediately de-asserted so that other cells destined for that egress queue can be accepted); and sending the XON message to the network processors, wherein the network processors will resume sending cells to the network processors associated with the bridge coupled to the switch port associated with the XON message in response to receiving the XON message (paragraph [0042], lines 20 – 23; Liu discloses that when the counter value decreases from the threshold, the back-pressure signal is immediately de-asserted so that other cells destined for that egress queue can be accepted).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Krishna et al (US 6,563,837) discloses a method and apparatus for providing work-conserving properties in a non-blocking switch with limited speedup independent of switch size.

Lolayekar et al (US 2003/0079019) discloses enforcing quality of service in a storage network.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yves Dalencourt whose telephone number is (571) 272-3998. The examiner can normally be reached on M-TH 7:30AM - 6: 00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yves Dalencourt
Dalencourt
March 25, 2005